



US DEPARTMENT OF DEFENSE

PATIENT SAFETY FOCUSED REVIEW



A Publication of the Patient Safety Center

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This Issue: Delay in Treatment

Executive Summary

- Delay in treatment is a leading event type for Root Cause Analyses (RCAs) submitted to the DoD Patient Safety Center. The recent addition of Joint Commission National Patient Safety Goal 16 prompted this focused review on recognizing/responding to our patients' changing conditions. (Pg. 1)
- Issues both unique and common to ambulatory (Pg. 2) and inpatient (Pg.8) settings are discussed.
- Over 50 % of the delay in treatment events involved outpatient care, 48% of outpatient events included patients under 18 years of age. Patients under 1 year made up 22% of outpatient events, with meningitis diagnosed in 22% of all pediatric cases. (Pg. 3)
- MHS RCA Casual factors were similar to Institute of Healthcare Improvement's (IHI) findings on failure to rescue. System issues were noted with communication, assessment, and transfer of care. (Pg. 3)

Important Points to Remember

- Contact attending surgeon/provider when post-procedure patient comes to ED.
- House staff supervision is essential.
- Treatment plans and provider orders need specific parameters triggering clear actions.
- Disseminate specific or specialized guidance widely.
- Management oversight is critical.
- Once is not enough—training must be reinforced.
- Tailor rapid response processes to the scope of care provided (e.g., pediatrics).
- Collaboration is crucial in healthcare: communicate, communicate, communicate.

Overall, the dedicated healthcare professionals that treat our service persons and their dependants provide competent and compassionate care, but on occasion that care is less than optimum. Delay in treatment has been a leading Military Health System (MHS) Root Cause Analysis (RCA) event type for several years. Recent addition of National Patient Safety Goal 16: "Improve recognition and response to changes in a patient's condition" prompted this focused review on delay in treatment.

Delay in treatment is comprehensive; it may include delay in diagnosis, failure to treat, or misdiagnosis. This Focused Review examines the clinical challenges within both outpatient and inpatient settings and suggests ways to improve management of a clinically deteriorating patient.

National Incidence

As of December 31, 2007, The Joint Commission reported that delay in treatment was the fifth most frequently reported Sentinel Event type since reporting for this Sentinel Event began in 1995.¹ Delay in treatment events occur across the healthcare continuum. Reported reasons for the delay are varied, and include: a) misdiagnosis, b) delayed test results, c) physician availability, d) delayed administration of ordered care, and e) poor communication.

While The Joint Commission's 2008 National Patient Safety Goal #16 below provides guidance to accredited hospitals, other healthcare settings (e.g., ambulatory) may benefit from similar actions.

Joint Commission 2008 National Patient Safety Goal #16

Improve recognition and response to changes in a patient's condition.

Each organization shall select a suitable method that enables health care staff members to directly request additional assistance from a specially trained individual(s) when the patient's condition appears to worsening. (#16a)

One Year Phase-in Period

April 1, 2008 – The organization's leadership has assigned responsibility for oversight and coordination of the development, testing, and implementation.

July 1, 2008 – An implementation work plan is in place that identifies adequate resources, assigned accountabilities, and a timeline for full implementation by January 1, 2009.

October 1, 2008 – Pilot testing in at least one clinical unit is underway.

January 1, 2009 – The process is fully implemented across the organization (Joint Commission).

* Facilities providing inpatient services to pediatric patients must have a process in place for this population.

Incidence Within DoD

While in fifth place nationally, delay in treatment is the third leading event type within DoD. The Patient Safety Center Registry has received 90 Delay in Treatment RCAs, 46 Outpatient (including two that crossed from outpatient to inpatient), 19 Inpatient, and 27 Others (including pre-hospital and transitions of care). Unless specified by the facility in their RCA, the nurse reviewer made the determination of location based on reviewing the event summary and the flow chart.

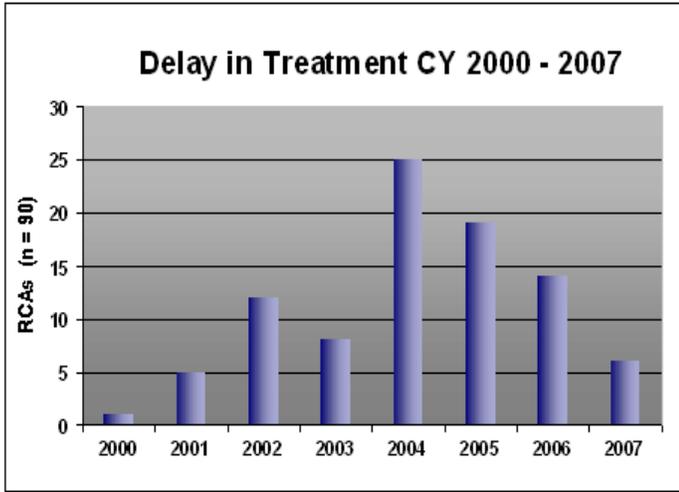


Fig. 1

Figure 1 shows the number (based on calendar years) of delay in treatment RCAs submitted since the inception of the DoD Patient Safety Program. As of May 2008, the total for 2007 is six. The incidence of delay in treatment RCAs has declined since peaking in 2004, although it is not possible to give a definite reason for the decline. Figure 2 shows delay in treatment by facility size.

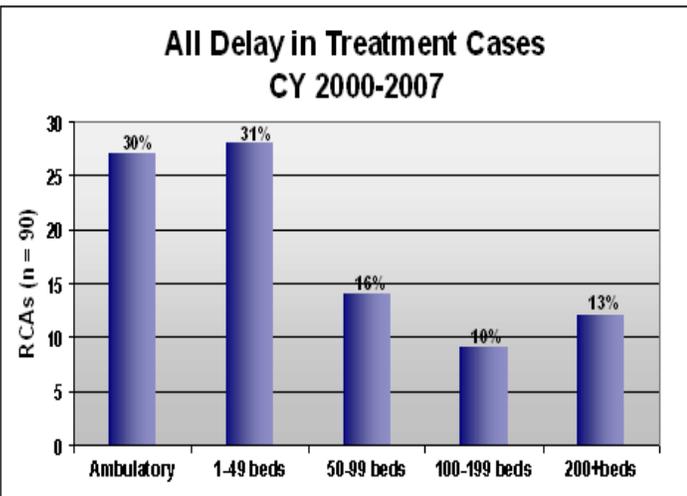


Fig.2

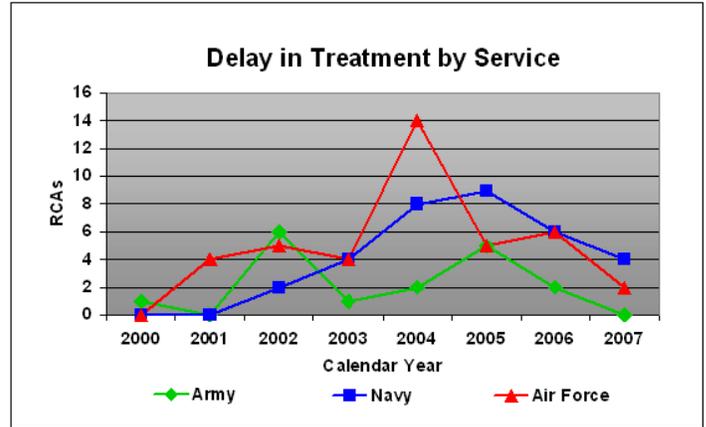


Fig. 3

Outpatient Delay in Treatment

Mary Ann Davis, RN

Ambulatory medical care is the predominant method of health care service in the United States. A 2003 survey of civilian hospital ambulatory care noted that 5.5% of all emergency department visits were for a follow-up visit of the same problem, and that approximately 3% of the patients had been seen in the emergency department within the past 72 hours.² Although the numbers are small, the consequences for the involved patient may be large. The DoD outpatient delay in treatment RCAs involved care either in a clinic or in an emergency department and discharge home. Returning for persistent symptoms appears to be a problem in the outpatient setting, sometimes with life-threatening results. Incomplete patient assessment; lack of communication; and poor, or lack of, coordination of care has caused repeat provider visits and delay of care.

Of the 90 delay in treatment RCAs, 51% (46) involved care in an outpatient setting (clinic or emergency department). Those 46 outpatient RCAs usually had multiple visits; with similar symptoms noted at each visit. There were 18 RCAs with multiple visits (more than two); 16 RCAs with two visits; and 12 RCAs with one visit (patient either discharged home, later hospitalized, found deceased at home, or died shortly after arrival at the emergency department). It is worth noting that of the 46 outpatient events, two events are also reviewed in the inpatient delay in treatment section of this focus review.

Figure 4 shows the top seven conditions associated with delay in treatment in an outpatient setting. Other conditions with one case each were: diabetic keto acidosis, respiratory arrest, intercranial hemorrhage, pulmonary embolism, dehydration, Stevens-Johnson syndrome, pneumocystic pneumonia, unresolved metatarsal fracture, chemical burn, and head trauma.

There were seven outpatient delay in treatment RCAs that resulted in emergency surgery* (Figure 4): 1) testicular orchiopexy related to testicular torsion; 2) perforated viscera status post appendectomy; 3) exploratory laparotomy revealing a

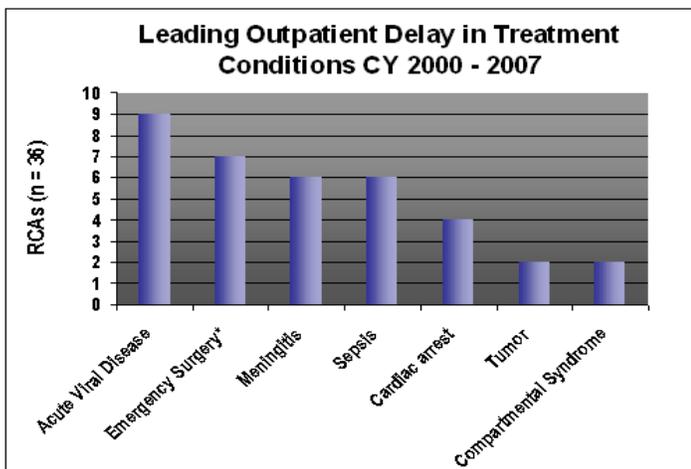


Fig. 4

perforated bowel secondary to a carcinoma; 4) removal of a foreign body from the esophagus; 5) exploratory laparotomy related to ileocolic intussusception; 6) open reduction and internal fixation of the femur; and 7) drainage of retropharyngeal abscess with possible substernal extension. Failure to communicate, failure to assess, and failure to recognize a patient’s deteriorating condition were identified in almost every operative event.

Patients less than 18 years of age made up nearly 30% (27) of the 90 delay in treatment RCAs, but the percentage increased to 48% (22) for the subset of 46 outpatient RCAs. The Joint Commission Sentinel Event Alert on delay in treatment noted meningitis as the most commonly missed diagnosed condition.³ While meningitis is the second leading condition causing complications in both adults and children, according to the RCAs received at the Patient Safety Center, five of those six meningitis cases involved

children. Acute viral infection and sepsis were the other two leading conditions.

The ages of the patients involved in the outpatient events ranged from 8 days to 64 years. *Figure 5* notes the ages by year. Three of the RCAs did not indicate an age. There is a noticeable spike in RCAs involving patients at one year or less. The gender makeup was 52% (24) female, 43% (20) male and 4% (2) not reported. Duty status consisted of non-active duty 78% (36), active duty 11% (5) and not reported 11% (5).

Military treatment facilities may have satellite clinics and Emergency Departments attached to their hospitals, and most of the outpatient care was given in those settings. *Figure 6* shows the distribution by size of facilities for outpatient delay in treatment RCAs. The smaller facilities (1-49 beds) had the largest number of events. There were 39% (18) teaching facilities and 61% (28) non teaching facilities involved in the outpatient RCAs.

The delay in treatment RCAs indicated various causes. Some causes were similar to the Institute of Healthcare Improvement (IHI) findings on failure to rescue. The IHI noted three main system issues that contributed to the failure to rescue (closely related to delay in treatment): 1) failure in planning (assessment, treatment, and goals); 2) failure to communicate (between patient and physician/staff, staff and staff, staff and physician); and 3) failure to recognize deteriorating patient condition.⁴

Ambulatory care is often difficult to coordinate. It involves frequent use of off-site laboratories and pharmacies, and referrals to specialty services and providers.⁵ Therefore, a lack of care coordination is another area related to delay in treatment. The Agency for Healthcare Research and Quality (AHRQ) defines care coordination as “a deliberate organization of patient care activities between two or more participants (including the patient)

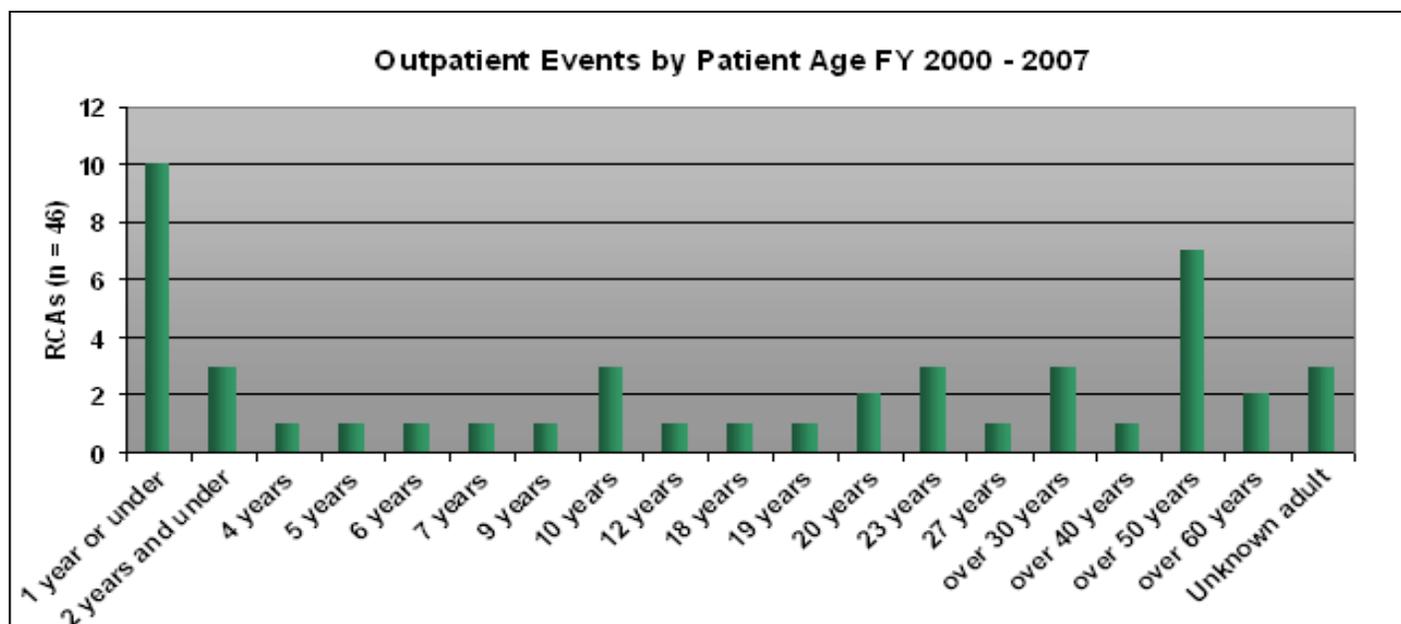


Fig. 5

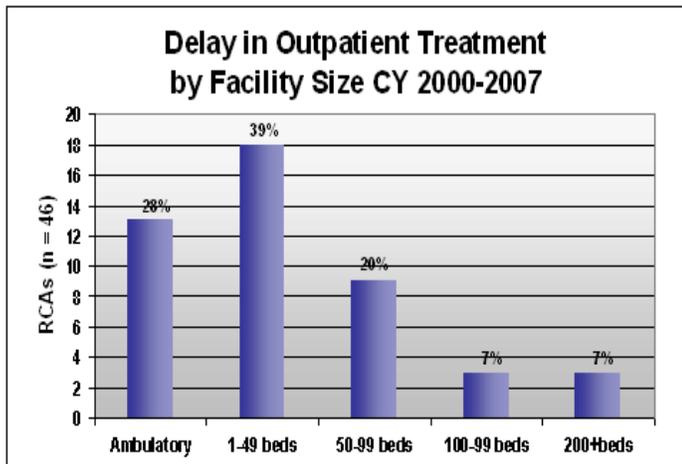


Fig. 6

involved in a patient's care to facilitate the appropriate delivery of health care services".⁶ Care coordination was incomplete or missing in most of the DoD outpatient RCA cases. The following outpatient case studies illustrate a number of these various system failures.

Assessment

A complete assessment is essential at the start of an evaluation and prior to discharge. According to The Joint Commission, 50% of Sentinel Events submitted in 2006 involved patient assessment as a root cause.⁷ Nearly all of the 46 outpatient RCAs received at the Patient Safety Center noted an absence of assessment, an incomplete assessment, or an undocumented assessment or test result. Lack of an assessment, or delay in relaying test results or information obtained during assessment, has led to an exacerbation of injuries and diseases, the loss of function, and even death. The following case study involves delay in treatment related to an incomplete assessment and lack of communication between providers. The case mirrors RCAs sent to the Patient Safety Center (PSC) that involved multiple providers and test results. This patient's squamous cell carcinoma went undiagnosed for eleven months.

Case Study: Dysphagia

The patient presented complaining of dysphagia and was referred to an ENT physician for evaluation. At the initial ENT visit, a small white area at the base of the tongue was noted during a fiber-optic examination of the throat. On the next ENT visit, the area was not evident by direct visualization, and swallowing difficulties were noted as decreased. The patient continued to complain of painful swallowing, left ear and jaw pain, and dysphagia. A repeat fiber-optic exam noted no lesions.

A GI consult was obtained for the intermittent dysphasia complaint. ENT visits continued, with com-

plaints of left mandibular pain. A barium swallow test was ordered, but had to be stopped because of barium aspiration. A modified barium swallow test was performed the next month, and swallowing mechanics were found to be grossly normal, although the test was incomplete.

The patient was referred to an oral maxillofacial surgeon for a complaint of left ear pain, and an MRI of the jaw was ordered. However, the MRI could not be completed due to the patient's claustrophobia. The patient was subsequently seen by a speech therapist who noted a change of color and deviation of the tongue. This information was not immediately conveyed to the primary care manager. The patient continued to lose weight, down 20 pounds in 6 months; a flow sheet to monitor the patient's weight was not utilized. A MRI with conscious sedation was ordered, but the patient could not tolerate it. The primary care manager was not called or advised that the MRI had not been completed. The speech therapist recommended a repeat modified barium swallow test, but there was no documentation indicating that the provider saw this recommendation in the patient's record. The patient continued to be seen by the ENT, and another fiber-optic exam showed edematous, pink vocal cords, noted as laryngitis. The patient's weight continued to decrease, and a chest x-ray was ordered for continued hemoptysis. The patient was admitted to the hospital three weeks later with weakness and hemoptysis, and a neck mass was discovered.

Causal Factors Noted by Facility

- No communication between ordering physician and network provider
- No timely communication of findings between Speech Therapist and provider
- No documentation of initial visit or assessment or recommendations
- No flow sheet for tracking weights

Actions Taken by Facility

- Place complex patients in case management to enhance communication and to follow up between network or specialty providers and PCM.
- Monitoring system in place to check on the results of all consults sent out to network providers.
- Providers will initial and date referrals when reviewed to indicate their review.
- New contract with network provider will specify that the provider must provide feedback and the information is placed in the patient's chart within 10 days.

- Develop flow sheet to track weights and other information related to the patient's overall health status.

Discussion

Tests were not completed, information was not conveyed from provider to provider, and there was a lack of care coordination. Multiple providers were involved, multiple tests ordered, and yet the symptoms continued. In a study of 181 malpractice cases involving missed diagnoses in an ambulatory setting, the most common process breakdowns for missed cancer diagnosis cases involved: 1) failure to order appropriate tests, 2) incorrect interpretation of diagnostic tests, and 3) inadequate follow-up of tests. One of the most frequent process breakdowns in the ambulatory malpractice claims study was an incomplete physical examination. Other leading reasons for process breakdown were provider lack of knowledge of appropriate test results and failure to elicit relevant information.⁸ The process breakdowns in the ambulatory malpractice claims study were similar to the ones seen in this case study.

Lessons learned

Communication was a key issue in this case.

- Better case management would have enhanced communication between providers by coordinating test results and follow-ups on referrals.
- Significant health issues can be identified by using flow sheets to show data over time. Flow sheets can organize data to reveal trends recorded in the treatment records.
- Documentation with initials and a date can validate that the provider has reviewed test results and consults.

Communication

Communication is essential in patient care; it's the number one root cause of Joint Commission reported Sentinel Events for the period from 1995 to 2006.⁷ The following case study illustrates the need for effective communication between providers, and between provider and patient. The case involves a patient fall and follow-up care. Three physical exams were performed by three different providers. A hip fracture diagnosis was finally made when the orthopedic consult ordered a repeat x-ray twelve days after the fall.

Case Study: Hip Fracture

A female tripped and fell on her hip while shopping and was taken to the urgent care center. Her major complaint was pain in her left hip. She was examined and x-rays were taken. The clinic physician wet-read the x-ray and the findings were negative for a fracture. The patient was discharged. The clinic physician did not log the x-ray test on the clinic comparative x-ray monitoring sheet. The radiologist who reviewed the film the following day identified the fracture, but he did not notify the ordering physician because he did not know that the film was from the clinic. Three days later the patient was at the family clinic for a follow-up visit related to diabetes. The patient still

complained of hip pain, and the physician noted the initial x-ray interpretation as being normal and did not verify the findings with radiology. Although the exam was abnormal, the physician discharged the patient. The x-ray findings were transcribed nine days after the fall and twelve days after the fall, the patient returned to the clinic with severe pain and spasms in her left hip. A consult was performed by an orthopedist and a repeat x-ray was ordered. The patient was diagnosed with a non-displaced proximal left intertrochanteric fracture, and surgery was recommended.

Causal Factors Noted by Facility

- Clinic physician did not verify radiological findings.
- Radiologist did not notify ordering physician of abnormal findings.
- Physician did not log patient information on the comparative x-ray monitoring sheet.
- X-ray monitoring sheet is not properly reconciled with x-ray log.
- X-ray film not transcribed as required.

Actions Taken by Facility

- Any urgent or clinically significant discrepancy between the final and preliminary interpretation of x-ray films will be communicated to the ordering physician or surrogate ASAP, either in person or by phone.
- New location was designated within radiology for all x-ray accomplished during non-duty hours. This provides an alert to the radiologist of films accomplished during non-duty hours and is a prompt to telephone the ordering physician when the interpretation differs.
- Physicians encouraged to directly call radiology department to confirm interpretations if necessary.
- The process of documenting patient information on the monitoring sheet has been formalized and will be included in unit orientation and training.
- Clinic shift leader ensures that monitoring sheet is properly updated at end of each shift.

Discussion

A study of closed malpractice claims involving missed or delayed diagnoses in an ambulatory setting noted the following process breakdowns: 1) failure to order appropriate diagnostic tests, 2) failure to create an adequate follow-up plan, 3) failure to obtain an adequate history, 4) failure to perform an adequate exam, and 5) incorrect interpretation of a diagnostic test. Cognitive factors, patient related factors, and hand-offs were the most prominent contributing factors overall.⁸ This patient was seen twice with complaints of hip pain, but the initial report noted no fracture. Lack of communication concerning an updated radiology report delayed treatment.

Lessons learned

Communication and training need to be improved:

- Timely hand-offs, including communication of critical test results, and effective communication between clinic and diagnostic department are needed.
- Staff needs to be trained regarding the process for contacting the primary provider when test results need to be communicated.
- The Emergency Department needs to reinforce communication policies and procedures for critical test results. Those policies should include direct communication of findings between the ordering physician and radiology or laboratories.

Transfer of Care

Many of these outpatient cases involved a lack of care coordination. Of the 46 outpatient RCAs indicating delay in treatment, 30% (14) noted a transfer to either another department or to another facility. Most of the transfers were for a higher level of care, and the rest were due to a lack of specialty care at the treating facility.

The following case study involved transfers between departments and between facilities. It involved a ten-month-old infant who presented to the pediatric clinic with difficulty breathing and ended with an emergent transfer to a hospital with pediatric ICU capabilities.

Case Study: Respiratory Distress

The mother of the patient initially called for a clinic appointment because the child was constantly crying and refusing to eat or drink. She received an appointment to be seen an hour later, but she decided to seek immediate treatment at the facility's emergency department. Upon arrival, the mother was told that there would be a two-hour wait and was advised to take the appointment at the pediatric clinic. The infant was not assessed at the emergency department. Upon arrival at the clinic, the infant was immediately seen by a medical technician, nurse practitioner, and then the pediatrician. The patient was ashen, with a distended abdomen, and a pulse oximetry of 92%. Nebulizer treatment was initiated, but the infant did not respond.

This was a small community hospital with no ICU/PICU and the decision was made to urgently transfer the infant to a children's hospital. When the call was made, the physician who accepted transfers at the children's hospital was not available, but he returned the call later and was advised of the infant's condition by the referring pediatric physician. Per protocol, the

receiving children's hospital pediatrician would call and notify the transferring hospital staff of the available bed. Care was transferred to the emergency department physician at the transferring hospital. The clinic pediatrician advised the emergency department physician that the case had been reviewed with the physician at the accepting children's hospital. The emergency department shift leader was to follow up with the transfer process.

Multiple problems occurred in the emergency department related to equipment and with the endotracheal intubation. The shift leader had assumed that the transfer was urgent, not emergent, and was awaiting confirmation of the transfer from the accepting physician. When CPR was initiated, the pediatrician arrived at the emergency department and intubated the infant, and the emergency department provider upgraded the transfer to a 911 transport. The pediatrician assumed care and accompanied the infant to the receiving hospital.

Causal Factors Noted by Facility

- Patient is not initially triaged at ED.
- Pediatric physician and ED physician communication concerning transfer status not clear.
- ED physician ordered nebulizer with oxygen, ED tech administered compressed air as per usual order.
- ED tech did not initiate call for Fire and Rescue until after securing an accepting physician and bed for patient.
- Delay in retrieving epinephrine and ambu mask missing from Broselow bag.

Actions Taken by Facility

- Comprehensive checklist developed to assist providers with transfers. Check list will contain key items such as the arrangement for transfer, accepting hospital, diagnosis, prognosis and treatment provided up to the time the ED accepts the patient.
- Modified transfer policy to include face to face encounter between provider relinquishing care and provider accepting responsibility of patient.
- Policy was rewritten to expand the definition of triage and further clarify the assessment process, roles and responsibilities of staff during the triage process.
- Crash cart checklist has been updated to specify critical items that must be inventoried on a monthly basis.

Discussion

There were several factors in play with this transfer, but the delay of appropriate treatment at a children's hospital was a major

factor. The nature of an emergency department necessitates a perpetual cycle of shift changes and hand-offs.⁹ In the ambulatory malpractice claims study, the failure to establish clear lines of communication was another communication factor besides hand-offs.⁸

Researchers have identified four major phases where hand-offs occur: 1) pre-turnover, 2) arrival, 3) meeting period, and 4) post turnover.¹⁰ This case study illustrates the need to establish a clear line of communication, as well as effective communication during each phase of the hand-off.

Lessons learned

The lessons learned in this RCA involved procedures and communication.

- Staff responsibilities must be clearly delineated and understood by all members of the emergency department.
- Appropriate communication has to be ensured during inter-departmental and inter-facility transfers, with assumptions being validated.
- All persons presenting to the Emergency Department must be registered and triaged, no exceptions.

Outpatient Conclusion

The recurring assertion of three main system issues that IHI found on failure to rescue are; failure to assess, failure to communicate and failure to recognize the patient's deteriorating condition.⁴ Several outpatient RCAs identified a lack of communication between the patient and staff during phone conversations with an advice line, a call center, or with the clinic staff. Noted in these RCAs were causal factors related to the assessment of the patient's condition, lack of clarification of the symptoms and the lack of a standard policy related to telephone triage. Since advice lines are increasingly being used by patients or their family as the first step to obtaining care, this area also needs to be explored.

The outpatient case studies clearly suggest a lack of coordination of care and a lack of both verbal and written communication. The Emergency Department was involved in several of the delay in treatment events. It is a clinical setting with high usage; where assessments and transfers require efficient and effective communication. A literature search provided the following recommendations for reducing the incidence of medical errors, including: team training; re-engineering and standardizing of processes, care coordination, and formalized hand-offs.

- A three year study involving more than 300 cases was undertaken to better understand where and how diagnoses fail and to explore target interventions to prevent failure. The recommendations from the study included: re-engineering follow-up of abnormal test results; standardizing protocols for reading x-rays/lab tests, particularly in

training programs and after hours; identifying “red flag” and “don't miss” diagnoses and situations; use of checklists; and engaging patients on multiple levels of their care.¹¹

- IOM recommended the use of team training to reduce incidences of medical errors. Team work takes planning, cultivation, training, and practice. TeamSTEPPS[®] offers a flexible, evidence-based toolkit to improve patient safety through enhanced communication and teamwork skills. TeamSTEPPS[®] promotes competency in team leadership, situation monitoring, mutual support, and communication.¹²
- System interventions are needed to make an impact on cognitive errors by: reducing reliance on memory; considering alternate diagnostic plans or second opinions; and using clinical decision support systems. Interventions to decrease delays in treatment or missed treatment can include: mandated second reviews of designated test results; or rapid expert reviews when the physician interprets a result outside of their area of expertise.⁸
- Transition strategies in the Emergency Room can include: read backs to ensure that both parties agree and that they comprehend the issues; inclusion of practitioners in hand-offs when other individuals are departing from the hospital (such as change of shift); limiting interruptions during hand-offs; and cross monitoring the hand-offs of others.¹⁰
- One of the areas of concern, coordination of care, has been addressed by AHRQ. The following are suggested approaches from AHRQ for improving care coordination:

The patient:

- Ensures that all necessary information is available for the clinician.
- Identifies family, friends, caregivers, and medical providers who are part of their medical “home” to ensure that all of the care coordinators are aware of the healthcare suggested or provided.
- Receives information about the healthcare team members responsible for coordinating services, and their distinct roles.

The provider:

- Identifies patients who are likely to have an increased need for coordination.
- Identifies the healthcare team member responsible for coordinating services and communicates this information to the patient.
- Provides patient education and clearly communicates the goals of a referral to other providers.¹³

Inpatient Delay in Treatment

Pamela Copeland, RN/JD

Case Study: Respiratory Failure

What Happened

A 20-year-old female patient underwent uncomplicated removal of four wisdom teeth under moderate sedation and analgesia in the Oral and Maxillofacial Surgery Clinic (OMFS). On the second postoperative day the patient presented to OMFS complaining of emesis, trismus (lock jaw), difficulty swallowing, labored breathing, and inspiratory pain. A general dentist examined the patient and diagnosed a postoperative infection and cellulitis at site of #32 extraction (submandibular and lateral pharyngeal wall). He irrigated the site, administered intravenous fluids, antibiotics, antiemetics, and discharged the patient from the clinic on oral antibiotics and pain medication. Within 24 hours the patient presented to the dental clinic with no signs of improvement.

Rescue Opportunity

The radiologist reviewed a CT scan and noted soft tissue infection adjacent to the submandibular gland with evidence of mass effect on the airway, but no drainable abscess. The OMF surgeon admitted the patient to the med-surg unit with a diagnosis of cellulitis of the right submandibular and neck region and ordered intravenous clindamycin, pulse oximetry monitoring, and pain management. The staff had never cared for a patient with this clinical diagnosis. The patient's clinical picture temporarily improved (decreased swelling and erythema), however, on second day after admission the patient's condition worsened—increased chest pain with inspiration; progressive tachycardia (138); increased swelling from the base of the skull past midline of neck, extending down to the clavicle. The Medical Officer of the Day (MOD) was called to evaluate the patient, interpreted the EKG and chest radiograph as normal, and ordered a sedative. The patient's declining clinical condition was not reported to the OMF surgeon.

Final Opportunity to Rescue

Within 12 hours on re-evaluation (rounding) the OMF surgeon determined the patient was worse. Repeat CT scan revealed that the submandibular abscess extended into the neck, with inflammatory changes in the mediastinum (possibly with mediastinal extension). Emergent surgery was scheduled with OMF/Anesthesia and General Surgery on board. Airway management was begun in the main OR holding area, but had to be quickly aborted because of compromised airway. Attempts at performing a fiber optic intubation resulted in

the patient becoming agitated, with air stridor. The anesthesiologist's attempt at non-surgical intubation failed, and the surgeon's surgical intervention failed to definitively improve the patient's ventilation. Problems involving equipment in the main OR included not having the appropriate endotracheal tube or a working capno-graphy. Intraoperatively, the patient became bradycardic, failed to respond to ACLS protocol, and died on the operating table.

This case underscores the cascade of events and failures that can develop when a patient clinically deteriorates. The salient delay in treatment nodes in this case involved the failure to recognize the significance of presenting clinical signs (e.g., elevated WBC count, increased temperature, onset of respiratory compromise); communication failures (not communicating with the OFM surgeon); and the lost opportunity for prompt and effective surgical intervention in the main OR (lack of equipment/functioning equipment) as well as the appropriateness of pre-op procedures.

Causal Factors Noted by Facility

The RCAT performed a credible analysis and provided numerous causal factors and actions. Those germane to the delay in treatment include:

Outpatient Signs of Clinical deterioration

- Post procedure instructions lacked specific indications for infection, complications of sedation/analgesia, and the need to present to ED after normal hours.
- Emergent follow-up post procedure clinic evaluation provided by a general dentist versus OMF surgeon.

Inpatient Signs of Clinical Deterioration

- CBC with WBC 24.2 (admission 30.0) and continuing WBC elevation was not recognized by the provider as non-reassuring, nor was a bacteremia/sepsis workup ordered.
- Abnormal vital signs did not trigger immediate notification of the primary provider OMF surgeon to assess the patient.
- No comprehensive instruction or protocol for the management of pain for inpatients (inability to adequately control the patient's pain may have been a missed sign that antibiotic therapy was failing to stop the cellulitis from progressing to frank abscess formation in the neck, with extension into the pericardial sac and thorax).
- Patient noted to be shivering during nursing rounds (rigors are a sign of bacteremia/worsening bacterial infection).

- The choice of antibiotic (clindamycin) may not have been appropriate due to the possible existence of resistant strains of oral bacteria).
- OMF surgeon #1 notified of 102°F temperature spike, but no change in therapy or work-up ordered.

Communication

- OMF not notified of changes in clinical status at critical junctures [PSC reviewer].

Management of Patient during Surgical Intervention

- Airway management begun in the MOR holding and not the operating room.
- Requested number 8.0 cuffed tracheostomy tube not in the OR.
- No capnography reading available (equipment ceased to function during the procedure, secondary device not used).
- No perioperative briefing conducted prior to administration of medication in holding area (response to the event was not well coordinated and providers' perceptions of the life-threatening nature of the incident appeared to vary).

Actions Taken by Facility

- Develop a policy and establish protocols for nursing staff to implement the Modified Early Warning Scoring System for use on the inpatient wards, and appropriate training.
- Revise medical bylaws to establish criteria for required formal consultations (e.g., internal medicine, infectious disease) for workup and management of the patient in cases complicated by a severe infectious process or not responding to standard therapies.
- Develop and implement a rapid response team.
- Implement preoperative briefing (team huddle: surgeons, anesthesia providers, perioperative nurses, and surgical technicians) for all surgeries and other applicable procedures, using audits and concurrent direct observations to verify compliance.
- Stock cart with varied adult and pediatric tracheostomy surgical sets; multiple size, cuffed, nonfenestrated tracheostomy tubes; and place in a central location.
- Revise anesthesiology policy to require patients with compromised airways to be managed in the operating room; have routine monitors applied; preoperative briefing/time out conducted; instruments checked; and the surgeons gowned and gloved before any manipulation of the airway occurs.

- Revise anesthesia protocol for compromised airway: where there is likelihood of a surgical airway being necessary, place an additional filter between the mask and the anesthesia circuit elbow to prevent blood and other fluids from being suctioned into the sampling tube and occluding it.

Lessons Learned

This case illustrates the transactional nature of care as the patient progresses across the treatment continuum. At each juncture (clinic, med-surg unit) staff members were not impressed with the “worst case” scenario—development of a mandibular abscess and the lethal sequelae that could arise. The plan of care, continuous patient assessment and monitoring, were adversely impacted as the staff were not alert to the possibility of the patient developing a threatened airway due to a fulminating infection. During the preoperative phase the patient's condition worsened such that the OR team had to respond emergently. Equipment issues (unavailable/nonfunctioning) impeded the team in efficiently responding to the life threatening situation.

Items to Consider

- Develop comprehensive post discharge instructions for the patient, stating with particularity the symptoms that should trigger medical attention.
- When the patient later presents to the clinic/ED, contact and communicate with the provider that performed the procedure.
- Provide treatment staff with a delineated treatment plan that includes clinical parameters/interventions, and a notification tree.
- Initiate the Universal Protocol for all procedures.
- When planning to perform procedures (e.g., intubation) ensure that the procedure is performed in the optimum setting and that equipment (includes emergency) is readily available and functioning). Include a treatment plan for anticipated complications.

Consider the following suggestions when developing a rapid response process that appropriately addresses the needs of a clinically deteriorating patient:

- Identify the patient population that you serve.
- Define the special considerations that are peculiar to this group, e.g., pediatrics, obstetrics, newborn.¹⁴
- Develop specific triggers/criteria that will aid the staff in recognizing beginning signs of clinical deterioration.
- Ensure that the response process will provide needed support and expertise to optimize the intervention and prevent the development of an irreversible complication.

Inpatient Analysis

Inpatient delay in treatment events account for 21.1% (19) of the total delay in treatment RCAs within the Patient Safety Center Registry. *Figure 7* portrays in-patient delay in treatment by Service.

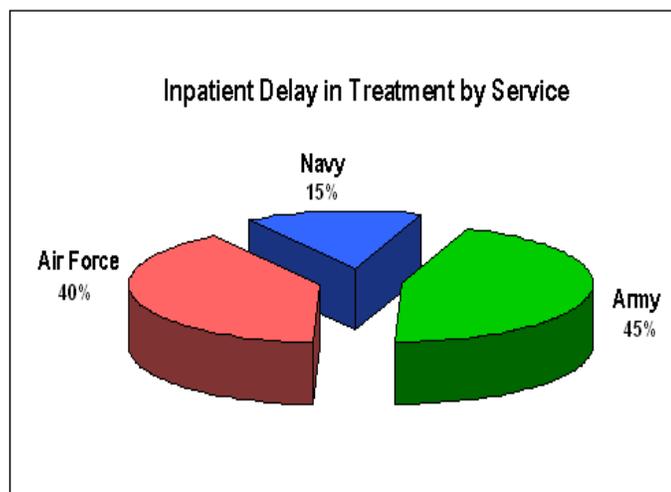


Fig. 7

Demographics

The age of patients involved in delay of treatment events ranged from 4 to 82. Their gender makeup was 50% (8) males and 47% (10) females, and 6% (1) not reported. Duty status consisted of non-active duty 82% (16), active duty 5.88% (1), and not reported 11.2 % (2) .

The leading locations for inpatient delay in treatment shown in *Figure 8* are ICU 47% (9) and the Ward 52.6% (10). The spectrum of time attributed to patients experiencing clinical

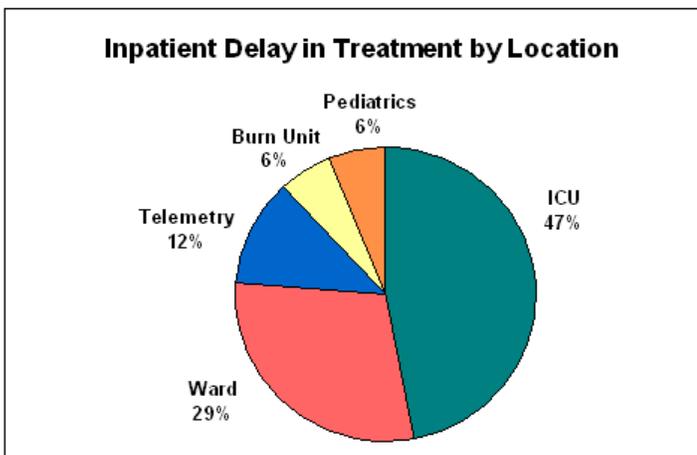


Fig. 8

deterioration was 150 min-utes to 43 hours.

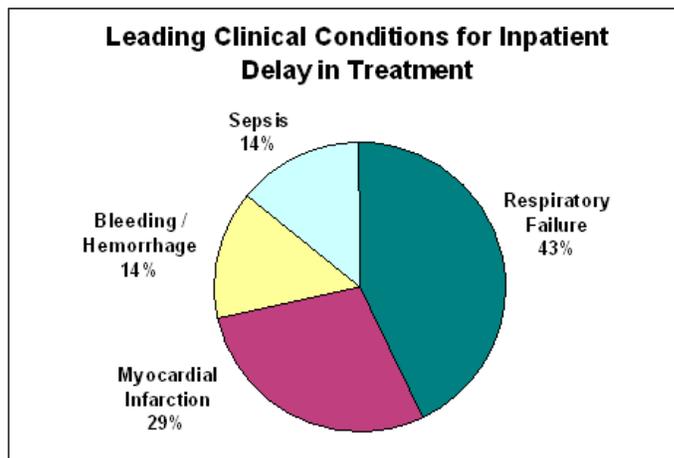


Fig. 9

Figure 9 shows the top four clinical conditions associated with inpatient delay in treatment. Other conditions with one case each were: inadequate fluid resuscitation, severe pre-eclampsia, acute renal failure, cerebral herniation, severe tissue and vessel necrosis. Also noteworthy is that 72% of events are associated with clinical conditions requiring immediate action. Of the patients involved in an inpatient delay in treatment event, 80% (15) died as a result.

Figure 10 portrays what percentage of the delay in treatment RCAs indicated a failure in a particular component of patient care. The leading components were:

Assessment: 28% (17) inadequate evaluation/interpretation of clinical presentations. Leading parameters are:

- blood pressure
- urine output
- diminished consciousness

Monitoring: 22% (14). Which included:

- decreased vigilance in following up on lab values (hematocrit, base excess)
- neurologic changes (headache, diminished mental acuity)
- challenges (changes in circulatory and hemodynamic status)

Communicating Findings: 20% (13). Which included the inadequate reporting of:

- changes in vital signs (hypotension, hypertension, tachypnea, bradycardia)
- decreased urine output
- changes in oxygen saturations

- response to interventions
- changes in clinical status such as: chest pain, lost pulses, substernal pain, respiratory distress, abnormal blood gases, cardiac arrhythmias, hemodynamic instability, change in Glasgow Coma Score (GCS), changes in mental status, evolving infectious process.

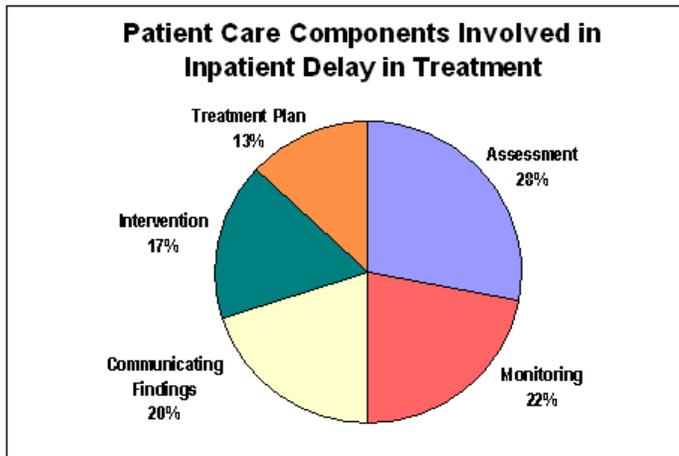


Fig. 10

Figure 11 indicates that providers were the leading entity involved with delay in treatment (47%), followed by nursing (44%).

House staff were involved in 25% of the events. In several cases, house staff and the events were tethered to the nurses caring for the same patient. Similarly, house staff inexperience with medical conditions (trauma, pre-eclampsia, recognizing evolving MI, fluid resuscitation, pain management/narcotic, hemorrhage) was a factor in poor patient outcomes. Additionally, inadequate communication with the attending, poor hand-offs between colleagues, and failing to seek consults contributed to delay in patient care.

Collectively, 19% of the events involved providers such as attendings, PA's, and MOD's. There were failures to: 1) respond to reports of clinical deterioration; 2) seek consultation from specialty trained staff (inexperience with medical conditions); and 3) adequately supervise trainee staff. Time frames involving inpatient clinically deteriorating patients occurred from 75 minutes to 43 hours. Medical consultants accounted for 3% of the events.

Nursing deficiencies included: 1) inadequate communication of changes in vital signs/clinical findings/parameters; 2) failing to escalate concerns to a higher authority; 3) inadequately responding to a subordinates' clinical findings; 4) lack of knowledge/experience in working with equipment (telemetry monitors/Swan-Ganz); and 5) inexperience with specific medical conditions (trauma, pre-eclampsia, compartment syndrome, fluid resuscitation, pain management/narcotics, and evolving abscesses).

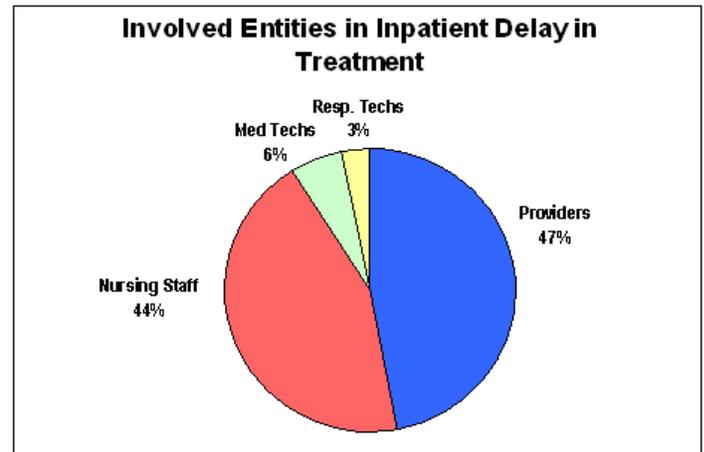


Fig. 11

In Figure 12 the top three leading root causes for inpatient delay in treatment are: training 27%, management system 24%, and communications 23%.

A number of RCATs (Root Cause Analysis Teams) noted that staff was not given adequate directions for monitoring the patient. When treatment plans were provided, parameters were often not included. Similarly, when specialty service protocols were developed for managing patients, they were not adequately disseminated to patient care teams; nor were the protocols included as part of the patient's medical record. Inadequate supervision of nurses and house staff was also a problem. Facility corrective actions include four areas:

Training initiatives

- educating staff about policy changes
- learning about certain diseases/medical conditions and clinical patient management
- interdisciplinary education.

Policy revisions

- formalizing the two challenge rule
- documenting response times
- adding clinical parameters to orders and criteria for notifying providers (nurses/residents/PAs)

New policies

- to aid staff in managing patients, e.g., algorithms (pulmonary embolism, fluid resuscitation)
- mandatory consult requirement
- rapid response teams
- adoption of patient evaluation tools, e.g., pediatric Glasgow Coma Scale

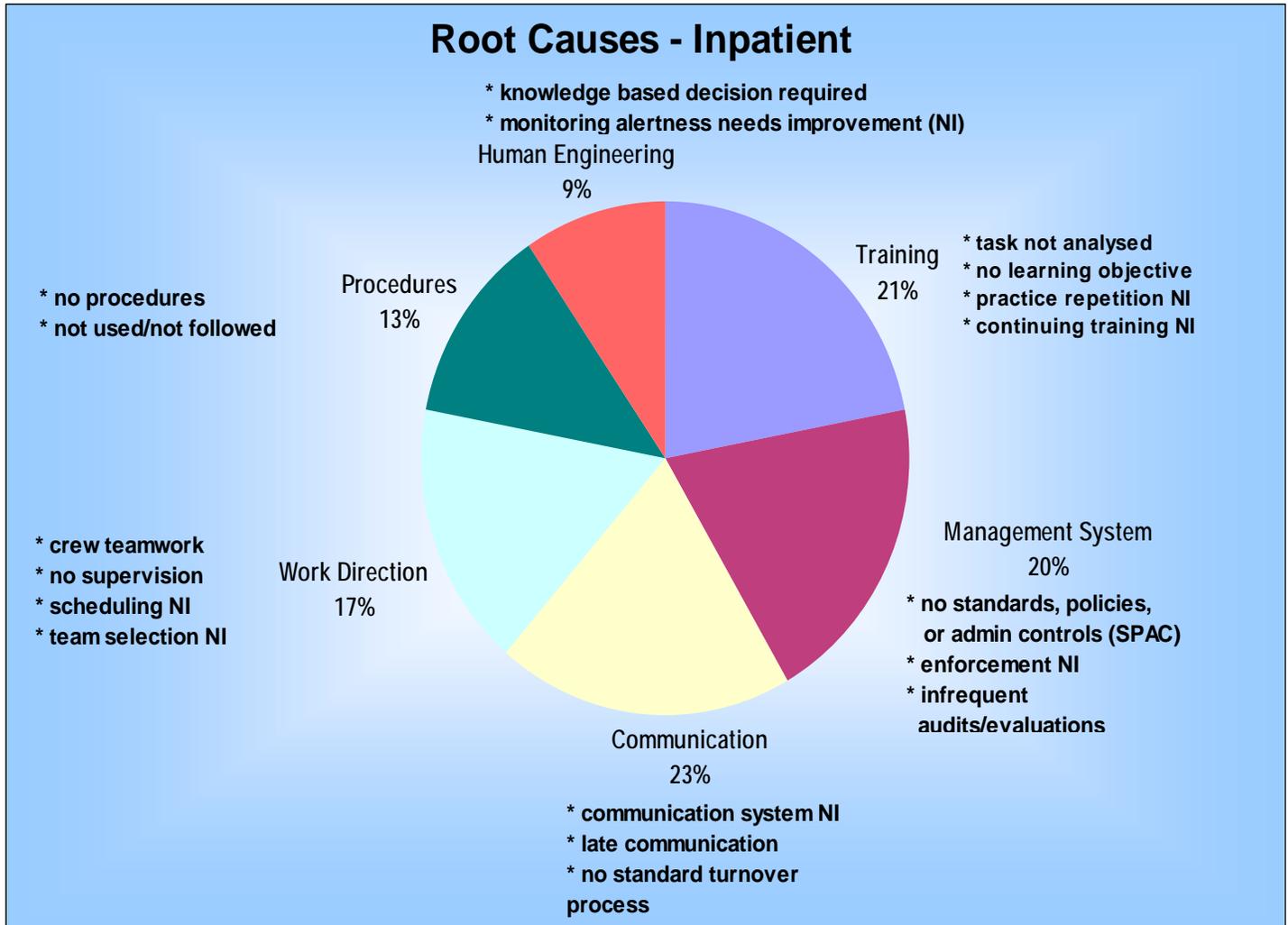


Fig. 12

- patient joint rounds with the treatment team
- standardizing post-op orders
- protocols for all ICU admits

Communication actions

- TeamSTEPPS® training
- institutionalizing the use of SBAR (Situation, Background, Assessment, Recommendation)
- multidisciplinary rounds
- formalizing hand-offs between house-staff, with attending communication component

Discussion

Patients experiencing clinical deterioration may manifest symptoms rapidly (75 minutes) or they may languish over a couple

of days (43 hours). Whether the patient is in the ICU or on the ward, a clinically deteriorating patient needs to be promptly identified, appropriately evaluated, and efficiently treated.

Case Studies

The following two case studies illustrate various delay in treatment issues. The first case (myocardial infarction) represents the most frequent type of treatment delay reported within DoD. It shows how staff may be misled by a patient's appearance when significant clinical findings suggest that intervention is needed. The second case (intracranial bleed) portrays how an established protocol was not considered during the plan of care. The introductory case (respiratory failure) presented on page 8 illustrates issues associated with a patient whose post procedure clinical presentation is not viewed as urgent by the staff. Delay in treatment case summaries are typically transactional. Therefore the presentations are lengthy. RCATs often identified numerous Causal Factors and developed comprehensive Corrective Action Plans. Therefore, only the salient Causal Factors and Corrective Action Plans germane to the event are presented below.

Case Study: Myocardial Infarction

What happened

A 71-year-old patient admitted for an elective laparoscopic Nissen fundoplication. Procedure was converted to an open laparotomy. Postoperatively, patient admitted to ICU. Senior resident's orders included notification for certain vital sign parameters.

Opportunity for Rescue:

Over a four hour period patient's cumulative urine output totaled 71 cc's (orders required notification with output <120 cc/4 hours); blood pressure decreased from 142/73 to 82/62 (orders required notification with SBP >190 or <90). RN #1 failed to recognize significance of low urine output and decreasing blood pressure, and did not report it to intern. When patient complained of pain under the breast, RN notified intern. On physically evaluating patient, intern wrote orders for 2 mg IV morphine (with repeat 1 mg if no relief with initial bolus) for breakthrough pain and to hold Lopressor® for SBP <130. Blood pressure continued to decrease. RN #1 eventually notified the intern of the low urinary output and blood pressure; intervention included infusing a bolus of 1 L normal saline/EKG rhythm strip.

Patient began complaining of abdominal pain (urinary output and blood pressure still decreasing); intern notified, surgeon #1 contacted, and stat H/H obtained—9.0/26.2 (pre-op H/H 14.4/42; initial post-op H/H 11.4/33). Surgeon discontinued morphine and ordered fentanyl and 1 unit packed red blood cell transfusion stat. Patient subsequently received intravenous fluid resuscitation of 1 liter normal saline bolus, CXR/KUB, and cardiac enzymes (first set negative). Within 30 minutes of being seen by surgeon, patient was taken to surgery (exploratory laparotomy) to rule out intra-abdominal bleeding. Intra-operative EKG showed wide QRS tach, L axis deviation, LBBB, abnormal ECG. Surgeon noted some blood in abdomen, but not enough to account for hypotension. Patient was expedited off the table and returned to ICU for continued workup and resuscitation. Post-op ICU orders included Swan-Ganz monitoring, dopamine drip, and cardiology consult. Subsequent diagnosis was status post peri-operative myocardial infarct secondary to prolonged hypotension due to unrecognized and untreated shock. Patient developed acute respiratory distress syndrome and was made a no code.

Causal Factors Noted by Facility

- The RN reported chest discomfort, but failed to recognize that low urine output and decreasing blood pressure were also significant findings that should have been reported. The patient's healthy appearance after major

surgery mislead the nurse into thinking he was doing well.

- The Intern focused on symptoms of pain and failed to investigate urine output and vital signs over the last several hours, resulting in failure to recognize developing shock. The intern lacked sufficient experience to recognize developing shock and did not know when to seek help from a clinical supervisor. A more structured hand-off to guide assessment and treatment would have helped. There is a need for increased practice under supervision (supervisors do not receive training on how to supervise effectively).
- The RN did not report substernal pain and increased oxygen requirement, failing to recognize it as a sign of the patient's worsening condition.

Actions Taken by Facility

- The intensive care chief provided nursing staff with effective communication tools (video) and the opportunity for role playing to apply the newly obtained knowledge.
- The nursing staff reviewed policies (physician notification, charge nurse responsibilities).
- Charge nurses will perform mid-shift patient status inquiries with each nurse and update the shift report sheet with information on each patient's 4Ps (facility hand-off model—Patient, Problems, Progress, Plan).
- Revise policy for supervision of residents to require in-house residents to make evening rounds on all general surgery patients in the ICU and on all consults received. Resident's notation in each medical record to be read by the attending staff surgeon on the following morning.
- Director, surgical residency program developed a structured model to update in-house residents regarding concerns about patients or any intraoperative, preadmission, or intraday events.

Discussion

This case emphasizes how cascading complications can result when the correct treatment modality is not promptly and effectively implemented. The acute phase of this patient's care and the inadequate appreciation/management of the patient's fluid status occurred over approximately 24 hours (involved two different shifts of providers and nurses). The RCAT noted that the intern was instructed to call the senior resident/provider if he had any patient care concerns. The nurses had a minimum of three years experience and there were written parameters for monitoring the patient. Neither the nursing staff nor the providers-in-training identified intimidation as a reason for not informing providers/supervisor of significant clinical findings. Ineffective communication impeded the ability of the team to revise the fluid resuscitation treatment plan. The reduced fluid volume

contributed to the prolonged hypotension, heart impairment, and respiratory distress.

Lessons Learned

Staff supervision by experienced individuals is critical to ensure that clinical findings outside acceptable parameters are definitively addressed. Both the house staff and the nursing staff were influenced by the patient's healthy physical appearance and thus did not attach significance to the objective clinical findings (decreasing BP/oxygen sats/urine output). This event occurred in the ICU—an area where the highest skill level of care is provided. Response to clinical triggers is paramount regardless of the setting and the obvious clinical appearance of the patient. Facilities are encouraged to consider including methods for ensuring that abnormal data has been reported and effectively responded to.

Case Study: Intracerebral Bleed

What Happened

A four-year-old sustained trauma to his head from a falling television at home. Patient presented to ED approximately 60 minutes after the event and was evaluated, treated, and discharged. Approximately six hours post discharge, patient returned to ED. Work-up (non-contrast CT Scan/X-ray/C-spine films) revealed frontal and basilar skull fracture. Pediatrics, neurosurgery, and general surgery consults were provided and patient was assigned to the family practice service. Admission orders to the unit included IV fluids and ondansetron for emesis.

Clinical Deterioration

Patient continued to have emesis, and voided once during the evening shift. Shortly after midnight patient had a Glasgow Coma Score (GCS) of 11 (RN notes: "Pt sleeping, difficult to assess right eye movement due to eyelid swelling and bruising. Four points off for lack of verbal response); approximately 60 minutes later patient was incontinent of urine (RN notes: "Pt wet bed, became agitated upon changing his clothes and bedding, did not appear to be fully awake")—none of the findings were reported to provider. Repeat GCS was 14. Approximately four hours after the incontinence, patient had bradycardic episode, was found posturing and hypoventilating/apneic. A stat CT scan revealed diffuse cerebral edema and impending herniation. Patient was given mannitol, hyperventilated, and placed on intracranial pressure monitoring. Brain death was confirmed two days later and life support was terminated.

Causal Factors Noted by Facility

- No admission baseline labs ordered or obtained.
- ED staff and the surgical subspecialty consultants that were called in were not aware of the pediatric trauma policy; the protocols were in place, but not used.
- Ambiguous orders without notification parameters were written for both neurologic status checks and I&O's.
- Last physician note entered approximately 11 hours prior to the event.
- RN did not notify the provider about the GCS of 11.
- Patient was initially awake, alert, and neurologically intact at the time of admission. The potential for serious complications was underestimated by the inpatient staff and consultants who evaluated and followed him.
- Initial chemistries and CBC obtained when arterial line inserted—30 minutes after first mannitol dose. Labs were affected by the mannitol.
- The Glasgow Comma Score was designed for adults, not children (a four-year-old could be expected to be irritable when awakened).
- RCAT concluded: The pediatric surgeon was TDY and not available. As an advocate for pediatric trauma priorities, the surgeon's response to the initial report of the injury may have led to a different pattern of care and possible outcome. This should not have been an issue. Policy should have substituted for his advocacy (e.g., pediatric head trauma policy). If a pediatric surgeon had been needed, either the pediatric surgeon on contract would have been contacted or, failing this, the patient would have been transferred to the children's hospital in town.

Actions Taken by Facility

- Trauma Committee to educate admitting services and ED staff about the pediatric trauma policy; when and how to access and/or initiate it.
- Modify pediatric trauma policy to include consideration of mechanism of injury, age limits, and particularly the closed head injury protocols. Also coordinate documents (SOPs, policies, protocols, clinical standards) to insure consistency.
- Adopt infant and child modifications of the Glasgow Coma Scale. Modify DCCS policy letter to include the recommendation that monitoring orders should include instructions for when to notify physicians as monitored parameters change (I&O and GCS in this case).

Discussion

This case illustrates the importance of developing a plan of care that includes relevant data and appropriate interventions based on patient classification and age appropriateness. Appropriate and timely consultation is critical to providing effective treatment. Neurosurgeons were consulted on the case, however, the pediatric protocol for head trauma was not considered, even though it had been published. Additionally, the adult GCS was not appropriate for pediatric use, and the pediatric surgeon was TDY. Specialty protocols that assist medical teams with managing patients must be widely circulated and incorporated into the facility's operations. Doing so enables the medical team to respond to the patient's needs promptly and consistently. Specialty unavailability requires notice and a means for obtaining off-site consultation.

There were multiple hand-offs of responsibility for this patient; four separate physicians in training saw the patient within a 21 hour period. The patient might have been monitored/managed more aggressively if specific information about the patient's injury and potential risks or possible complications had been mutually known by all consultants and attending responsible.

Lessons Learned

Policies/guidelines/protocols providing specialized guidance to staff must be widely disseminated, as treatment plans may have significant omissions that may result in compromised patient care. Age specific protocols must be utilized where appropriate. Adequate specialty coverage must be ensured when staff is on leave/TDY. The treatment team should have information on how to access interim assistance.

The issue of multiple hand-offs increases the likelihood that salient information (treatment, diagnostic results, interventions, physical and clinical findings) may go unreported and/or the significance of this information may not be adequately addressed. Additionally, the nursing and trainee staff may not be sure to whom they should report significant findings or unresolved issues. Effective handoff processes must ensure that critical information is efficiently and consistently shared.

Items to Consider

- Formalize hand-off process by using TeamSTEPS methodology.
- Implement walking rounds and medical record reviews as part of the hand-off process.

Variables Having Impact on DoD Cases

The following case vignettes are provided to illustrate variables that have impacted patient care and contributed to delay in treatment.

Culture Issues

Culture is the way we do things, and cultural issues can have an adverse impact on patient care—resulting in delayed treatment. The following text is taken from RCAs received at the Patient Safety Center.

Case #1 Intracranial Bleed

“The issue of who admits and who takes primary responsibility for patients can be strongly affected by cultural factors rather than written policy. Issues of “turf” and perceived workload can affect decisions as to who takes charge of individual patients. This can lead to subspecialty providers not taking primary responsibility for a patient.”

“There is an assumption that the family practice service will admit and care for all patients from their panel who are admitted to the hospital, unless they are admitted to an ICU. This can impose a perceived obligation to be responsible for patients that may have medical problems outside their competency or scope of practice. The culture may inhibit residents or staff from asking another service to take over responsibility for a patient. There is a similar reluctance to ask for backup help when things are busy. Asking for help when appropriate can reduce the risk of missed/overlooked issues or problems, and should be encouraged, especially in a training environment”.

Lessons Learned

Management is charged with ensuring that patients receive appropriate and timely care. Cultural issues can adversely impact patient care. Coordinated care, efficient hand-off of information, and accountable management can minimize negative cultural influences by increasing team communication to achieve optimum patient treatment and outcome.

Items to Consider

- Mandatory consultations for management of patients with specific subspecialty clinical needs.
- Formal documented consultations.
- House staff rounds and communication with attending for patients that are non-responsive to intervention.

Staffing/Scheduling/Patient Admission/Transfer

Issues involving staffing/scheduling/patient admission and transfer have adversely impacted on the quality, timeliness, and appropriateness of care that a patient receives. Issues involving staffing may impact the hand-off process; matters involving patient admissions may result in orders being overlooked and

transfer issues involving patients who need higher levels of care may be delayed because of staffing issues. These statements from cases illustrate these challenges.

Case #1 The patient developed intra-abdominal hemorrhage; a repeat H&H was not obtained as ordered.

“Unit was inundated with admissions prior to patient’s arrival, despite staff request for admission delays until the next shift, consequently, admission database was not complete; missing admission orders were not pursued.”

Case #2 A bipolar pre-eclamptic patient was admitted from the ED to the ward.

“This patient (pre-eclampsia) was managed on the antepartum ward rather than on L&D. Monitoring of this patient on L&D may have prevented maternal death, fetal death, or both.”

Case #3 An 84-year-old patient fell from a ladder and sustained multiple rib fractures.

“Patient was not transferred to a higher level of care due to failure to recognize and/or respond to oversedation, respiratory distress, and gastrointestinal complications.”

Lessons Learned

These cases illustrate how patient placement on a particular unit may impact the quality of care that is delivered. Once a patient is admitted to a unit, adequate time and attention is needed to evaluate the patient and implement the care that is needed according to the treatment plan. Patient admissions to units overwhelmed with patient activity may result in significant information/treatment needs being missed, and compromised patient care. The appropriate setting and staff expertise ensure that the patient is provided the optimum opportunity to have her clinical condition appropriately managed. The decision to transfer also involves the timelines of the transfer. Facilities are encouraged to assess their inter- and intra-facility transfers for efficiency and timeliness.

Items to Consider

- Develop a policy that addresses criteria for patient admission or transfer to certain wards/units.
- Establish a checklist for in-patient floor admission, with hierarchical responsibilities.

Training

Training is a critical component for ensuring staff competency, however, continuous training is needed to ensure staff

confidence and continued competence in performing tasks/functions with each patient encounter. Sophisticated technology/equipment is available to better monitor patients. Patients are managed and monitored more effectively when staff demonstrate continuing competency. The following cases illustrate this issue.

Case #1 A bi-polar pre-eclamptic patient was admitted from the ED to the ward.

“Although the individual had successfully completed their initial training, they did not perform adequately; possibly because they had forgotten the training or lost required skills over time. Recent required changes to residency training have resulted in less patient contact time and fewer patients seen, which may result in a loss of pattern recognition skills for patients significantly complicated by both obstetric and psychiatric diagnoses.”

Case #2 Patient developed severe respiratory distress and coded.

“The respiratory tech did not know where code buttons were located.”

Case #3 The patient developed progressive heart block and coded.

“Float staff not familiar with manipulating leads to enhance EKG interpretation and alarms were inadvertently turned off.”

Case #4 Patient developed compartment syndrome subsequent to having knee surgery.

“The ICU tech and MSU staff were unfamiliar with the A-line set-up and had never used it to monitor a patient with compartment syndrome.”

Lessons Learned

Once is not enough, staff quickly forget basic concepts unless there is follow-up on education. This also applies to knowing the clinical diagnoses and the established management/treatment protocol. Technology augments the treatment team’s ability to assess and monitor a patient’s condition. Effective patient care management dictates that staff are competent to use equipment/technology during patient care. For new procedures, staff need to be formally trained prior to actually using equipment.

Items to Consider

- Implement multidisciplinary treatment modules for selective perinatal clinical conditions, and practice drills.
- Provide practicums with new technology to develop staff competency.

- Develop an abbreviated user's guide that summarizes the salient features and applications of the technology/equipment, and place the manufacturer help center information prominently on equipment and include it in the user's guide.
- Train technology/equipment super users.
- Educational items with call criteria and pager numbers, especially magnets, badge holders, and pens, can be extremely effective.

Supervision

Case # 1 A bi-polar pre-eclamptic patient was admitted from the ED to the ward.

“The team's misplaced focus on the patient's “agitation” may have led to their failure to recognize critical indicators that could have mitigated the event. The team may have seen the indicators, but left the problem uncorrected due to a lack of experience with this type of patient.”

“The charge nurse could have intervened and given voice to the apparent ward staff discomfort with management of this patient. If a satisfactory response was not forthcoming, she could have taken the concern up the chain of command. Regarding the decision to admit or transfer this patient to L&D, the supervising attending physician and charge nurse failed to provide optimum support, coverage, and oversight to the involved providers.”

Case # 2 Patient with pneumonia developed prolonged tachycardia and respiratory distress.

“The inexperience of both the nursing and medical staff contributed to the delay in treatment. The medical care of the patient was assumed by interns who were in their first month of on-call internal medicine rotation.”

Lessons Learned

Both of these cases occurred in the ICU, where clinically complex and demanding patients are hospitalized and managed/treated by the most experienced staff. In a teaching facility, however, inexperienced staff are part of the treatment team regardless of location. Even within the ICU, clinical triggers should be used and guidance provided, along with effective supervision.

Items to Consider

- Establish a modified early warning scoring system and reporting for each specialty area that reflects the pertinent criteria.

Elevating Concerns

Case # 1 A bipolar pre-eclamptic patient (previously presented) was admitted from the ED to the ward.

“The repeated calls from the RN to the PGY4 OB resident suggests a significant concern about the patient's condition and care at that time. It appears that the structure of this communication may have been “hints” regarding this discomfort via proxy or repeated phone calls, rather than direct expression of this discomfort. These indirect signals were not enough to alert the resident physician.”

Case # 2 Patient sustained a pneumothorax subsequent to having a pulmonary artery catheter inserted.

“Patient with increased shortness of breath and fever. The pulmonologist recommended a CT scan to rule out empyema. Radiologist #1 declined. The internist consulted with the pulmonologist regarding the patient's worsening shortness of breath and hypoxemia. A third physician requested CT scan. Pulmonologist contacted radiologist # 2 who subsequently agreed to perform the procedure.”

Case # 3 Patient developed compartment syndrome subsequent to having knee surgery.

“Provider disregarded patient's worsening conditions and recommendations by Director of Surgical Services.”

Lessons Learned

These cases illustrate the issues regarding communicating concerns about patient care up the chain of command. The involved communication stalemates include: 1) nursing to trainee provider, 2) provider to provider, and 3) provider to supervisor. The first case illustrates the importance of having a dialogue that expresses unequivocal concern and a call for action. Management must ensure that processes are in place to empower staff to alert those having the clinical expertise/authority to address the patient safety concerns. This process must ensure that 1) appropriate authorities are notified, 2) response time is timely, and 3) interventions are appropriately implemented.

Industry Trends

Facilities are developing innovative processes to better respond to patients experiencing clinical deterioration. Below are two areas that have emerged—modification of the RRT concept and patient initiated response processes. While these processes may be worthy of consideration, further study is needed to determine their full impact and value before they can be endorsed for wider applicability in the Military Health System.

Denver Health Medical Center	
<u>Adult Rapid Response Escalation Criteria</u>	
Physical Clinical Condition Trigger (combined IHI and Denver Health triggers)	
The nurse is to determine whether the patient condition is one of the following:	
_	respiratory rate < 8 or > 28
_	acute change in oxygen saturation < 90% despite oxygen administration
_	threatened airway
_	acute change in systolic BP to < 90
_	acute, sustained increase in diastolic > 110
_	acute change in heart rate < 50 or > 120
_	acutely cold, pulseless, or cyanotic extremity
_	confusion, agitation, or delirium
_	unexplained lethargy
_	difficulty speaking
_	acute change in papillary response
_	new seizure
_	temperature greater than 39.0 Celsius_ uncontrolled pain
_	acute change in urine output < 50ml/4 hours
_	acute bleeding

Fig. 13a

Variation on the Formalized Rapid Response Team

On analyzing the institution's resources and processes, Denver Health Medical Center, a tertiary care center, developed a methodology for responding to the clinically deteriorating patient that did not include a formal RRT. The following summarizes why Denver Health developed and implemented a variation of the RRT.

Evidence for supporting broad implementation was at best tenuous. Denver Health concluded that since they have in-house residents and interns 24 hours a day 7 days a week, a variation on the RRT better suited their needs and would ensure a timely and thorough assessment and plan of care for patients showing signs of deterioration. *Figures 13a and 13b* summarize the Denver Health's Rapid Response Process.¹⁵

Patient Initiated Response Process

In one of the DoD delay in treatment events, a patient's spouse became very concerned about her clinical condition and requested to see the Medical Officer of the Day (dental abscess case). The MOD responded and evaluated the patient. While the facility did not have a patient initiated response process, the spouse felt compelled to have his wife evaluated. This underscores that patients and family members are an additional safeguard in identifying and summoning assistance when there appears to be clinical deterioration.

Approximately twenty hospitals have implemented a Patient Initiated Rapid Response Process (PIRRP) team.¹⁶ This emerging trend reinforces that healthcare facilities have invited patients/family members to be part of the patient safety team in summoning help when a patient does not appear to look "quite right". Three representatives (See Acknowledgements) from healthcare facilities that have implemented PIRRP have provided the following insights into developing a PIRRP.¹⁷

Denver Health Medical Center
Communication Algorithm

Nursing Responsibility

The nurse is required to call the provider directly responsible of the patient, and using SBAR communication, relay her urgent concern for the patient and identify the patient as an “adult rapid response clinical trigger” call.

Resident Responsibility

On receiving this call, the protocol mandates that a physician perform a face-face patient evaluation CPOE or verbal telephone orders are precluded until a physical evaluation is conducted. Orders for diagnostic purposes (blood gas, EKG, chest radiograph) are permitted.

Physician Non-Response

If there is no physician response within 15 minutes, or unresolved concern about the patient, the nurse is expected to contact the senior resident, the attending physician, or even the director of the service.

Documentation

The nurse/resident and attending physician are required to complete the Adult Rapid Response form.

Direct Supervision

The resident must discuss the intervention and the patient’s response within four hours of the rapid response call.

Fig. 13b

Defensiveness: The initial reaction by staff (RN and MD) was reluctance and fear that their care or response to the patient would be perceived as lacking, and they did not buy into the PIRRP. Data was used that showed the location (outside the ICU) and percentage of patients that experienced clinically deteriorating conditions requiring intervention. Key stakeholders were involved in developing the PIRRP. Once the process was developed, provide on-going education. Results—Staff buy-in.

Prescriptive Process: Developed a clear explanation for patients on how to initiate the process; patients were not burdened with the IHI¹⁸ RRT clinical parameters. Provided a listing of what was not germane to the PIRRP; helpful in minimizing inappropriate use (e.g. diet issues, room cleaning, etc.). Patient/family received verbal education, along with revised patient handbook on admission; reminders provided throughout the stay; posters placed within the room and throughout the facility; segments intermittently on the hospital television station.

Findings to Date: The PIRRP has been infrequently activated. Those that were activated were appropriate and this information was widely published within the facility. Patient surveys reflect that patients find this process empowering and comforting (peace of mind that their problem was taken seriously). Next Steps: Two of the facilities are developing a PIRRP for the pediatric unit; one facility is developing their RRT process for the ambulatory setting and will incorporate a modified PIRRP.

Inpatient Conclusion

A considerable number of preventable delay in treatment RCAs were attributed to failures in clinical vigilance. Optimum patient outcome may have been impaired from the beginning by the plan of care. Appropriate specialists may not have been involved with the care at the onset. When consultation was sought, the coordination of care may not have been directed by the most appropriate specialist. Consults may have been provided on an informal bases.

The quality of the plan of care also may have had an impact on how the nursing staff interpreted and responded to the treatment orders. Parameters or triggers for monitoring a patient were not explicit and providers did not clearly note when they were to be alerted. Additionally, the treatment team did not impart to the team members at the bedside indications for the worst case scenario that could develop relative to the patient’s diagnosis.

The timeliness of a medical/surgical intervention has an impact on diminishing further clinical deterioration. The RCAs revealed that inaccurate interpretations of vital signs, neurologic and hemodynamic changes, and lab data effected the treatment course. These findings were not shared in a timely manner, and the patient’s clinical condition spiraled downward. When the provider prescribed an intervention, the staff failed to monitor,

document, report, and evaluate the patient's response to the revised treatment. Policies that ensure the cycle of assessment and reassessment with appropriate monitoring and re-evaluation of the treatment effectiveness are critical to patient well being.

Effective communication, the bedrock of a responsive and effective team was impaired by unclear notification parameters, intimidation for fear of retribution, and the failure to elevate concerns to a higher level. Effective management oversight is critical to ensure that team members are empowered to be heard and respected when advocating on behalf of a clinically worrisome patient.

Armed with learning methodologies like SBAR and TEAMSTEPPS[®], rapid response processes further ensure that the concerned staff member summoning assistance for a patient will obtain a timely response, support, and intervention each and every-time. Management is charged with ensuring that patients receive appropriate and timely care.

Cultural issues can adversely impact patient care. Coordinated care, efficient hand-off of information, and accountable management can minimize negative cultural influences by increasing team communication to achieve optimum patient treatment and outcome.

These cumulative and suboptimal process failures adversely impact on quality care and patient safety. Clinical competency and consistent management oversight are fundamental to providing quality care. But when a patient shows early signs of decline, the implementation of a timely and well coordinated response process (notification triggers, a response tree for the appropriate expertise) will provide the best support and management for a clinically deteriorating patient.

“Other” Delay in Treatment

Mary Ann Davis, RN

There were 27 delay in treatment RCAs received at the PSC that have not been included with either outpatient delay in treatment or inpatient delay in treatment. These 27 events have been designated as “other” delay in treatment and have a variety of reasons for this designation. Of the eight cases involving treatment in the Emergency Department, two patients died while being treated in the ED; six were admitted to the hospital and three subsequently died during hospitalization. Five events involved the ambulance crew responding to an emergency call and care being given onsite. Unfortunately, all of the patients expired at the scene or shortly after treatment.

Five events occurred in a clinic or urgent care facility. Two of them involved dental clinics with patients needing care for cardiac complaints. Two events occurred in the urgent care center; a patient complained of chest pain, became unresponsive, and the staff was unable to revive him. The second event involved a child in respiratory distress, became unresponsive and

transferred via ambulance to the hospital. The fifth event occurred in a community clinic and is discussed in the next case study.

There were five events involving specimens that were either lost, misread, or the results not relayed in a timely fashion. The remaining four events involved a test result delay, referral delay, delay in a follow-up after a procedure, and a multi-event review involving four recruits with a delay in treatment involving various types of infections. The following case study involves an admission after being evaluated at a community clinic and Emergency Department.

Case Study: Hyperkalemia

A middle-aged male presented to the community clinic at 1247 with complaints of severe abdominal pain. He stated he took an “unknown” pill and ingested a large amount of alcohol. He was sent by ambulance from the clinic to the Emergency Department with complaints of abdominal pain; labs were drawn and an EKG performed. ETOH level was 0.84 and potassium (K+) was 6.2 at 1438, and repeat K+ was 6.9 at 1553. Internal medicine doctor was contacted, admission orders written, and care turned over to the oncoming emergency doctor. Repeat labs were entered under the wrong provider's name in CHCS. While awaiting transfer to the floor, a CT was performed. At 1810 the patient was brought to a room by the ED staff. The admission orders were illegible and were not clarified with staff. At 2200 pharmacy notified the floor RN of the increased K+ level and advised RN to give medication ASAP. When the doctor was notified of the increased K+, an ICU transfer was requested. Sent to ICU at 2320 and at 2400 the lab called the ICU with 7.3 K+ result. At 0005 the patient's monitor shows multiple Premature Ventricular Contractions and a code blue was initiated. Patient pronounced dead at 0055.

Causal Factors Noted by Facility

- Time sensitive interventions (i.e., Kayexalate[®], Lasix[®]) not given prior to transfer.
- No interventional orders before transfer.
- No medication other than IV fluids given while in ward.
- ED staff did not have a policy to guide them on dealing with transfer orders when the patient was not transferred immediately.
- ED staff did not have a policy on reviewing transfer orders for time sensitive interventions when there was a transfer delay.

Actions Taken by Facility

- Create a policy memo that includes the responsibilities of the ED provider when the patient has been accepted by another service but remains in the ED for more than an hour.
- Establish methods to obtain medication, process labs, and order diets when CHCS (computerized patient record system) is not working.
- Evaluation of transferring patient will be performed by nurse on the arrival to the ward. Patient transferred at change of shift will have additional information beyond taped report with a 1 on 1 reporting session.
- Ensure that all nursing supervisors assign the patient to the appropriate nursing unit based on the patient's nursing care requirements, scope of service, capability of staff on duty and level of nursing staff.

Discussion

This event is similar to others events noted in the focus review, the patient was seen in a clinic sent to the Emergency Department for evaluation and then as his condition and lab studies became critical he was transferred to the ICU. Unfortunately, communication of the critical lab results and the need for immediate treatment was delayed. Both verbal and written communications were ineffective.

Lessons learned

- Transfer orders will be reviewed for time sensitive actions if transfer is delayed by more than one hour.
- Admitting providers will clearly communicate, both verbally and in written orders, their plan of care and its timeline with nursing staff in ED so that it can be conveyed to the accepting ward/unit during report.
- A standardized transfer report form is to be used when patients are moved from one nursing care location to another. Nurse will evaluate the transferring patient on arrival to the ward. Reports will include diagnosis, condition (including vital signs), IV fluids, medication given, pending orders, and any special requirement.

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The DoD Patient Safety Center (PSC) is dedicated to improving patient safety in all military healthcare settings through the study of adverse patient care events in military treatment facilities.

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